U.S. EPA TECHNICAL SUPPORT PROJECT
BUSINESS SESSION MINUTES

October 25-28, 1999
Las Vegas, NV

U.S. EPA TECHNICAL SUPPORT PROJECT CO-CHAIRS

Engineering Forum:
JoAnn Cola, Region 9 • Camille Hueni, Region 6 • Steve Kinser, Region 7

Ground-Water Forum:
Curt Black, Region 10 • Luanne Vanderpool, Region 5

Federal Facilities Forum:
Meghan Cassidy, Region 1 • Steve Hirsh, Region 3 • Paul Leonard, Region 3

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BACKGROUND

The Fall semiannual meeting of the Technical Support Project (TSP) was held in Las Vegas, Nevada, from October 25-28, 1999. The Engineering Forum planned the meeting in conjunction with the Department of Energy's 11th Technical Information Exchange Workshop. The workshop served as the forums' technical sessions on October 26 and 27.

On Monday, October 25, members of the three TSP forums (Engineering, Ground Water, and Federal Facilities) toured the proposed nuclear waste repository at Yucca Mountain. They held their business sessions on October 28. In addition to the business sessions, the Engineering Forum sponsored a roundtable on Landfills and Reuse, and the Ground Water Forum presented technical discussion on passive diffusion samplers.

This document summarizes the discussions and presentations held during the forums' business sessions and the technical sessions sponsored by the Forums. A summary of the roundtable discussion is not included in this document, however, but will be available in December 1999 on the TSP's website at http://www.epa.gov/tio/tsp/.

ENGINEERING FORUM

Oxygenates Issue Paper

The Engineering Forum commented on the draft oxygenates issue paper that was prepared by Dave Burden (NRMRL/Ada). Frank Vavra (Region 3) noted that although parts of the paper are excellent, the Engineering Forum was interested in expanding it into a larger paper that would consolidate general engineering methods used to treat chloride compounds, not just MTBE. Moreover, Linda Fielder (TIO) is involved in developing a paper on cases studies related to oxygenates that is due out by the end of this year. Rich Steimle (TIO) recommended that the Engineering Forum co-chairs meet with Linda Fiedler, Dave Burden, and a representative from OSWER's Office of Underground Storage Tanks to determine the roles of the different groups and to prevent overlap in their papers. *Steimle agreed to arrange for a teleconference for the participants, within two weeks, to discuss the issue paper. Vavra will then develop a scope of work, with time frames and goals, for the new issue paper and present it Dave Burden.*

Roundtable Discussions on Landfill Reuse Follow-up

The Engineering Forum agreed that the roundtable discussion on landfills and reuse was informative and resulted in many good ideas and observations by the panelists and audience. Chet Janowski (Region 1) asked if the Forum should have someone from headquarters look at the final draft paper on the Roundtable discussions. The Forum agreed that the draft final should be sent to Ken Skahn (HQ), Andrea McLaughlin (HQ), Walter Kovalick (HQ) and Lisa Boynton (HQ) for review. The first draft will be completed by November 19, 1999 and will be provided to the co-chairs for review. The final paper will be distributed electronically to all the TSP Forum members, Laboratories, STLPs, and State participants and will also be posted on the TSP web site. *Rich Steimle agreed to ask Tech Direct to announce the paper in their newsletter.*

Bob Stamnes (Region 10) suggested that the Forum obtain more information on the various insurance funding mechanisms cited during the roundtable discussions. Steimle commented that the Forum needed a spokesperson in headquarters who could champion the Engineering Forum's goals. The Forum will arrange a meeting with Steve Luftig (HQ), during the Spring 2000 Meeting to develop a sponsorship relationship with the Forum. Bob Stamnes suggested that perhaps the Forum should align itself with the Brownfields and Superfund Initiatives.

The forum agreed to compile information from the roundtable discussions to determine what guidance and considerations are needed for Landfill Reuse/Design. The Forum can then use these points to talk with headquarters at the Spring 2000 meeting.

Joint Projects

Ed Mead (USACE) presented topics that the Engineering Forum members and USACE could pursue collaboratively. The topics were:1) explore the costs and variables of transportable incinerators; 2) process sampling with field kits; 3) soil vapor extraction; 4) in-situ oxidation; 5) thermal enhanced extraction; 6) the 5 year remedial systems review; and 7) an update on the remediation technology screening matrix and reference guides. The Forum members indicated that they would be interested in collaborating with USACE. *The Engineering Forum agreed to review the items and select a committee that will decide on a topic by the next conference call.*

Bob Stamnes reported that the ecological risk group in Region 10 would like to work jointly with the Engineering Forum. The Forum members listed the following areas that could be possible joint

projects:1) sediment cleanup/dredging; 2) rodent barriers in landfills; 3) environmental designs for habitat enhancement; 4) ecological cap design; and 5) remediation restrictions for ecological use. Mark Granger (Region 2) will be the Engineering Forum contact for EcoRisk and Steve Kinser will be the alternate.

Deborah Griswold (DOE) indicated that the DOE was interested in working with the Engineering Forum projects especially at the field level. Specifically, DOE is interested in long-term monitoring issues. Griswold asked the Forum to keep DOE in the loop, because it has flexibility with its contractors and can offer resources.

Trish Erickson (NRMRL/Cincinnati) reported that although she did not have specific projects that the Forum could work on, there were issues that could be addressed, such as: 1) long-term performance of containment systems; 2) reliability management; 3) mercury remediation; 4) SVE off-gassing; and 5) solidification and stabilization.

Joe King (Marasco Newton Group) reported that athletic field design guides were currently being reviewed and future guides were being developed for commercial, ecological, parking lot, and golf course uses. King requested that one Forum member from each region review the athletic field design guide and provide feedback within two weeks. The following Forum members agreed to participate in the review process:

Chet Janowski, Region 1
Mark Granger, Region 2
Stacie Driscoll, Region 3
Jon Bornholm, Region 4
Tony Holoska, Region 5
Camille Hueni, Region 6
Steve Kinser, Region 7
Bill Rothenmeyer, Region 8
JoAnn Cola, Region 9
Bob Stamnes, Region 10

Construction Equipment Handbook and Video

The proposed construction equipment handbook and video will provide RPMs with a source of information on construction equipment including, production rates, capacity, and other statistics on the machinery. *Steve Kinser will research the Response Action Contractor (RAC) guides, Trish Erickson will research the Superfund University training course, and Steve Nussbaum (Illinois, EPA) will research the Caterpillar Handbook as resources for the handbook. Steve Nussbaum will develop the preliminary information for the handbook and have it ready in six months for the Forum to review.*

Web Page Update

Mark Granger (Region 2) reported that efforts to place the TSP web site on the EPA home page have reached a plateau. Granger explained that EPA divisions such as the Air, Water, and other programs are competing with the TSP for space on the EPA home page. However, Granger, with Rich Steimle's assistance, was able to obtain the url http://www.epa.gov/tsp that can be accessed from the EPA web site and can be used on TSP documents.

Participation Agreement

Stacie Driscoll (Region 3) distributed the finalized Engineering Forum participation agreement to the members. To date she has received only 14 of the signed agreements. Driscoll will archive the agreements and send the co-chairs a list of the Forum members that have not yet signed the agreement.

Spring 2000 Meeting

The Ground Water Forum will take the lead and set the agenda for the Spring 2000 TSP meeting to be held April 25- 28 at the Wyndham Hotel in Washington, D.C. The meeting will include a joint session on phytoremediation presented by OSWER. Additional topics for the agenda will include: joint USACE papers, updates on ecological risk, the oxygenates issue paper, USACE cooperative projects, the construction manual, membership participation update, landfill reuse guides, Forum goals and progress. Other possible topics for the meeting may include a follow-up on landfill redevelopment presentation, treatment of oxygenates and PCBs, and a brief guidance update from headquarters.

Monthly Conference Call Logistics

The Forum agreed to improve the technical issues presentation discussed during the monthly teleconference calls. Camille Hueni (Region 6) urged members to submit the technical issues two weeks prior to the conference call. All technical information, including phone numbers, contacts, and web sites mentioned during the conference call need to be sent to Angela Morales (EMS, Inc.) for incorporation into the minutes. Steve Nussbaum commented that the Forum needed a format that described the objective and background of the technical issue. Nussbaum added that "lessons learned" should also be included in the conference call format. *Trish Erickson (NRMRL/Cinn) offered to send the Forum a template to be used to input the technical issue information.* Dave Reisman (NRMRL/Cinn) reported that the laboratory can utilize the Remediation Information Management System (RIMS) database to provide technical information to the RPMs. *Reisman will send Angela Morales a brief summary of RIMS that will be distributed to the Engineering Forum.*

FEDERAL FACILITIES FORUM

Regional Round-Up

Federal Facilities Forum Co-chair, Paul Leonard (Region 3), welcomed the forum members to the semi-annual meeting. To open discussions, Forum members and state participants identified the issues of most concern in their regions and states:

Region 1 (reported by Meghan Cassidy):

Air Force
- land use controls
- evolving expectations
- joint goal setting (especially for construction completions, Federal Facility Agreements (FFAs), and closeout and optimization issues

Formerly used defense sites (FUDS)

Massachusetts Department of Environmental Protection (reported by Bob Campbell):

FUDS
- uncertain number of sites (>700?)
- under state regulations, sites are ranked according to seriousness, but FUDS sites don't rank high
- the U.S. Army Corps of Engineers (USACE), the PRP, does not understand Massachusetts DEP methods
- priority setting differences between USACE and Massachusetts DEP
- reporting

Unexploded ordnance (UXO)
- Nomans Land (Navy's target site near Martha's Vineyard)

Arsenic levels in soil
- Conducting chemical speciation of arsenic and tissue analysis to help identify potential site uses

Region 3 (reported by Steve Hirsh):

FUDS

UXO
- bombing range in Chesapeake Bay (not a facility, nor does it have RCRA status)

Land Use Control and Plans (LUCAP)/Memoranda of Agreement (MOA) for Institutional Controls

Site completions
- reuse activities
- low-risk site closeouts (Timothy Fields, Assistant Administrator OSWER, is pushing for 85 sites per year)
- ecological risk assessments

FFAs (Air Force and Army)

Region 4 (not reported)

Region 5 (reported by Gary Schafer):

Air Force
- airfield support
- Finding of Suitability Transfer/Finding of Suitability to Lease (FOST/FOSL) vs. real activities

Navy funding
- SOUTHDIV's funding was cut by 75%

UXO characterization
- The Army wants to characterize 2% of the site. Is that good enough?

Communications problems, e.g., proper documentation/timing
- EPA won't review FOST
- FOST first/RI later

Region 6 (reported by Chris Villarreal):

POM budget[1] (money that DoD has earmarked for environmental restoration)
Perchlorate
- in dispute resolution with the Army
- public water supplies will be monitored for perchlorate

Lead-based paint at Base Realignment and Closure (BRAC) sites
Reluctance to characterize ecological risk (mostly the Air Force and the Army)

Kansas Department of Health and Environment (reported by Leo Henning):

FUDS
- Funding for states to see if site investigations need to be done at FUDS

UXO
- Chloride contamination as a result of spreading salt on bombing ranges to keep the ground from freezing
- Atlas and Nike sites

USACE
- lack of involvement when a PRP is found

USDA grain bin sites (carbon tetrachloride contamination)
- USDA provides an alternate water supply but does not do a site investigation or cleanup

Air Force and Army cleanup levels (industrial vs. residential)
Ground water to surface water discharges
- Army doesn't have to clean up ground-water plumes to rivers

Propellants and explosives cleanup levels
- Dispute with USACE and Army over chunks of nitrocellulose in the soil at the Sunflower Site. The USACE and the Army say it is no longer explosive, but the Kansas DHE questions the appropriateness of the Army's method of testing ignitability.

Region 8 (reported by Sandra Bourgeois)

Coordination with USACE (not just on FUDS)
FUDS: Who is the lead agency—EPA or USACE?
What information belongs in the Information Repository vs. the Administrative Record?

Region 9 (reported by Glenn Kistner):

BRAC resources
- how to prioritize activities?

UXO
- what to do until policy is issued?
- appropriate standards

Thermal treatment producing dioxins
- Greenpeace issues
- Division Director must review all proposals for thermal desorption

Institutional controls (ICs)
- California won't approve ICs. Wants agreement providing covenants to control their use.

FUDS
- UXO
- lead agency: federal facility vs. private

Ecological risk assessments in 5-year reviews (whether they've been done and their quality)
Sediments and sediment cleanup

[1]Villarreal indicated that the Army has said that a facility's POM budget for the next 5 years is set regardless of what money the facility will need and when it needs it. The facility can request additional funds, but these funds must come from another facility's POM budget. Villarreal distributed a sample spreadsheet for the Longhorn AAP showing the constrained cost to complete restoration work and the POM budget.

- Navy cleanups
- multiple sources
- cleaning up sediments without creating other contamination problems

Lead-based paint

Region 10 (reported by Harry Craig)

ICs
- Air Force wants a national policy on ICs
- Before a facility closes, what do you do?

Impact of Endangered Species Act requirements on sediments at Navy sites (salmon)
Hybrid 120 agreement in FUDS
Construction completions
- EPA wrote a PCOR on a state-lead site because Washington didn't have the same sense of urgency about the site.

UXO (NPL)
- 2% site characterizations
- dispute resolutions
- applicability of DoD Explosives Safety Board (DDESB) standards as an ARAR

Perchlorate Update

Chris Villarreal (Region 6) summarized EPA's growing concern over perchlorate in the environment and subsequently discussed what is being done about perchlorate contamination at the Longhorn Army Ammunition Plant (LHAAP).

The perchlorate ion (ClO_4^-) is a very mobile and persistent chemical in the environment. If ingested, perchlorate has been shown to stimulate the excessive release of iodine from the thyroid. Thus, exposure of individuals to sufficiently high amounts would be expected to produce symptoms of hypothyroidism. Also of concern is the effect temporary inhibition of thyroid hormones may have on children and the developing fetus.

The EPA has established a provisional reference dose of 0.0001 to 0.0005 mg/kg-day which results in an action level range of 4-18 µg/L ppb for perchlorate. Perchlorate is currently on the SDWA contaminant candidate list, and may be regulated by 2003. Monitoring of drinking water supplies for perchlorate may be required by Unregulated Contaminant Monitoring Rule pending promulgation of an analytical method to detect perchlorate. A primary source of perchlorate contamination is the process used to remove and recover propellant from solid rocket motors. Perchlorate also may have been used in some fertilizers.

The LHAAP is an 8,500-acre Superfund site on the Texas-Louisiana border. Perchlorate was not identified as a problem at the site until early 1998 when lower detection limits for the chemical were attained. Eighteen buildings at the LHAAP produced or used perchlorate. Building 25C has been identified a major source area for perchlorate at LHAAP.

Four tributaries drain the surface water from the LHAAP. This surface water as well as the local ground water flows to the northeast into Caddo Lake—the only natural lake in Texas. Goose Prairie Creek drains the area around Building 25C. In February 1998, the surface water in a non-vegetated part of this drainage area was sampled following a heavy rain. The sample contained 11,000 µg/L perchlorate. On the same day, 460 µg/L were measured in a sample from Goose Prairie Creek and 11 µg/L were measured at the plant boundary (Caddo Lake). Building 25C has been recently demolished because it was determined to be structurally unsound. Following demolition, the surface soil at the site was covered with excess landfill cover liner to reduce surface water runoff.

Contaminated ground water at the LHAAP is being treated at the Burning Ground No. 3 ground water treatment plant to remove solvents and metals. Approximately 20 million gallons of ground water have been treated and discharged into Harrison Bayou. In April 1999, an effluent sample was found to contain 14,500 µg/L perchlorate. A sample collected at the treatment plant outfall contained 1,500 µg/L, and two samples collected from the plant boundary (Caddo Lake) contained 97 µg/L and 38 µg/L. The ground water treatment plant is continuing to operate, although state perchlorate interim action levels for discharge have since been set at 375 µg/L (daily average) and 795 µg/L (daily maximum concentration).

In response to an ongoing dispute, the Longhorn facility is trying to secure $2.5 million to address the perchlorate problem at LHAAP. The State of Texas wants the Army to commit to a treatment system by 2001, but a process to treat the perchlorate to the state's discharge criteria has not yet been identified. The State and EPA have requested the Army to collect samples offsite in Caddo Lake, but so far, they have refused. The EPA in consultation with the Louisiana Department of Health and Hospitals, identified Blanchard, Louisiana as the closest downstream public water supply from Longhorn. In May 1999, EPA sampled the Blanchard, Louisiana public water supply - the samples measured non-detect at 10 µg/L for perchlorate.

In August 1999, the State of Texas and EPA collected 16 surface water samples from Caddo Lake. The samples were analyzed for VOCs, SVOCs, explosives, and perchlorate. The Burning Ground No. 3 ground water treatment plant was not discharging at the time. Only minor amounts of chloromethane, a VOC, were detected. In the future, the USGS pursuant to an IAG with EPA will conduct a sediment core study at the lake. Texas Tech University will be conducting a perchlorate ecological study (funded by DoD) at LHAAP. A perchlorate treatability study and further site characterization will be conducted pending a resolution of the current dispute between the State of Texas and the Army.

Participation Agreement

The Federal Facilities Forum (FFF) needs to develop a participation agreement specifying their membership requirements. The participation agreement would be provided to new members and management to explain expectations and membership requirements.

To avoid "reinventing the wheel," the FFF agreed to modify the participation agreement developed by the Engineering Forum to make it applicable to FFF participation. They reviewed the Engineering Forum's participation agreement line-by-line making the appropriate changes. The red line/strikeout version of the text is contained in Appendix A.

FFRRO Update

Renee Wynn, Assistant Director of the Federal Facilities Restoration and Reuse Office (FFRRO) indicated that FFRRO had asked for feedback from the regions regarding how FFRRO has been responding to their needs. She added regions vary in what they ask from their coordinators.

Wynn indicated that FFRRO's ability to respond may decline because their staff has dropped from 12 to 9 persons. There are two permanent vacancies and one temporary vacancy (expected early next year) due to medical leave. FFRRO had asked for volunteers for detail assignments. However, although FFRRO interviewed 13 people and six expressed interest, their management would not allow them to participate in the detail. Wynn suggested that a regional detail may be an option.

Lead-Based Paint Update

Wynn summarized efforts underway to by DoD and EPA come to an agreement on how to address contamination resulting from lead-based paint. Wynn reported that the joint interim field guide for lead-based paint in residential properties, being prepared by the two agencies, is on Tim Fields' (Assistant Administrator of OSWER) desk awaiting signature. The guide does not address non-residential facilities occupied by children, such as day care centers.

Attempts are underway to clarify and document an agreement reached between Tim Fields of OSWER and Sherri Goodman of DoD in August 1998 regarding language to be included on the suitability of various property types for residential use. EPA's position is that if it is unconvinced that problems do not exist, deed restrictions, including tools such as simple notifications, are required. The disposition of "child-occupied property," continues to be unclear. As part of the agreement with DoD, EPA was to conduct a national pilot study to compare the processes for managing private versus federal facility sites with lead-based paint. In the interim, a smaller pilot study was done in Region 9, which EPA feels provides sufficient information to justify its proposed language. However DoD still insists on a national pilot study. These points are still being negotiated.

PCBs in Buildings

It was reported that an unusual application of a Toxic Substances Control Act (TSCA) rule has been preventing the transfer of a Navy-owned facility to a private company. The Indianapolis building had been scheduled to be transferred to the Raytheon Corporation. Raytheon's due diligence environmental consultant found small amounts of PCBs in paint on structural steel inside a drop ceiling. The paint was in good shape and did not present a health threat. Nevertheless, the building could not be sold, pursuant to a TSCA rule that prohibits the distribution of contaminated substances in commerce. EPA will not grant enforcement discretion because it does not want to set a precedent which may be applied to many buildings.

Although OPPTS is considering promulgating a rule for this type of situation, enforcement discretion will not be granted and the building will not be transferred until the issue is resolved. Another potential interim approach is to use the early transfer policy. EPA headquarters is conducting an emergency review of this approach and expects to complete it in early November.

Institutional Controls

OSWER management has undertaken efforts to renew the Agency's dialogue with DoD concerning an interim policy for ICs. The U.S. Navy has implemented a policy similar to the EPA's current draft policy, and the U. S. Army has recently drafted one. DoD is not in full agreement with the pending draft.

FUDS/FUDS Enforcement

Recently, the public and the states have been seeking more progress at FUDS. With the growth of cities and towns, properties that once were in rural areas and had no designated reuse are now in demand for reuse. Although the regulatory agencies are fairly consistent in following CERCLA, the USACE has been more ad hoc, seemingly selecting some CERCLA provisions to follow and others to ignore. The DoD FUDS manual is not specific enough on a number of points and is inconsistent. One troubling issue is that DoD does not sufficiently welcome regulator oversight. It appears to be ingrained in their culture that they are doing an excellent job and do not need the oversight. A review of 300 NFRAP sites in one state found that 10 needed further work. One report indicates that there is a lot of UXO at FUDS.

EPA feels that because a number of FUDS may be NPL caliber and because there is now a demand for the reuse of many of these sites, we should have a comprehensive and accurate list of the universe of FUDS and their status; each of the thousands of FUDS estimated to exist should have a complete site assessment; and enforcement vehicles, such as NPL listings, should be delineated. EPA has a number of projects to explore this issue. EPA met with the USACE, but the two agencies still have differences. EPA wants to be sure that FUDS receive adequate attention in the budget as well as at particular sites. Region 7 has funds for cooperative agreements. EPA is drafting a policy on FUDS and is planning to fund states and, perhaps, tribes. EPA anticipates that a draft of this policy will be completed by December 1. The more active states in this area include Kansas, Missouri, Virginia, Massachusetts, and Alabama. A draft is anticipated by December 1. Through ASTSWMO, 10 states are scheduled to meet with the USACE in December.

Construction Completions

Wynn reported that construction completions are anticipated at only four federal facilities in FY 2000, and EPA would like to increase this in order to reach its goal of 85 for both federal and non-federal facilities. In an effort to get DOD to increase its completions, Tim Fields sent a letter to Sherri Goodman of DOD asking if there are other sites that may be completed.

Other Issues

In response to a number of questions, Wynn reported on the status of several other issues:

Fort Ord Litigation: Wynn reported that the Office of General Council plans to appeal a recent appellate court ruling that says that a party can sue on the basis of remedy issues before the remedy is implemented.

Non-NPL Federal Facilities: Apparently, DoD can use BRAC funds to get EPA involved , but they are not interested in having EPA oversight.

NRD Claims at DOD Sites: A question was raised about the implications of NRD claims for cleanup funds. It was mentioned that such claims are a possible enforcement tool, but there are not many such cases.

Future Federal Facilities: There will be a new program, possibly called the "Federal Property Transfer Program," funded for FY 2002. FFRRO and the DoD have issued a joint memorandum asking regions for input on the operation of this program.

Contaminated Sediments

Steve Hirsh reported on EPA's efforts to draft a policy on contaminated sediments and respond to other contaminated sediments issues. He handed out written questions and asked the FFF members for input to this effort by responding to them by November 16, 1999. Each regional contact is asked to collect the results for their region and forward them to Renee Wynn.

In the FY 1999 Appropriations Conference Report for EPA's budget, EPA was urged "to await the National Academy of Sciences (NAS) study before spending any Superfund money on dredging, initiating any new dredging action, or issuing any more dredging orders" to address contaminated sediments. This "moratorium" has been extended into FY 2000. To address this report language and other contaminated sediment issues, the Superfund program has started to draft a policy on how to address contaminated sediments, and FFRRO has been asked to represent the Federal Facilities program in drafting the policy and responding to other contaminated sediment issues. The responses to

the questions will be used to inform discussion and will not become a list of sites to track. Site descriptions will be useful to better illustrate the issues.

Several key issues were identified: (1) The regions need detail on the dredging moratorium. (2) We need to determine if the NAS report applies only to non-federal sites. (3) The FFF should be on the lookout for problems that are unique to federal facilities that may get overlooked by those developing the sediment policy (e.g., radium dials from World War II in landfills).

Proposed UXO Handbook

Douglas Bell (FFRRO) handed out an annotated outline of the proposed UXO handbook and requested comments from the FFF on the scope of the document. Two key questions are: Should it be more or less technical? Should regulatory material be left out? It was stated that the inclusion of regulatory material may slow up approval of the document, as it would get entangled in regulatory issues. The group agreed that the document should address technical issues and applications. The regulatory issues should be addressed in a second document.

The handbook is intended primarily to give EPA RPMs technical information they need to know, but likely will be used much more widely. This document will be a useful part of the strategy to address UXO, since it will probably take some time to promulgate a range rule. FFRRO's goal is to hand out a draft to the group in one year.

An issue paper on UXO is expected to be released in mid-November and will need peer review. The military often ignores site characterization or only does one or two percent clearance, and does not seek to cooperate with other agencies. The Navy is not apt to characterize areas that have no reuse potential.

Regional Roundup Action Items

The forum members and state participants identified what needs to be done with the following issues:

<u>FUDS</u>
- It is important that all Forum participants make sure everyone is aware of the Kansas City meeting on December 1-3; make their concerns known to Renee Wynn; and ensure that appropriate regulatory personnel attend the meeting.
- Each region should compile and summarize the types of enforcement actions taken at FUDS to Scott Marquess.
- The outcome of the Kansas City meeting will be reported at the December conference call.

<u>UXO</u>
- Forum participants are to submit comments on the UXO handbook outline to Doug Bell.
- Forum participants should provide examples of site-specific UXO issues and situations to Renee Wynn as soon as possible.

<u>Ecological Risks</u>
- Check on the forthcoming guidance on ecological risk. This is to address a Reluctance by some DOD services (mostly the Air Force and the Army) to characterize ecological risk. (Carol Bass, OERR)

<u>Institutional Controls</u>
- Doug Bell will check with Renee Wynn on the ongoing activities and workgroups and report back to the FFF.
- The Forum will develop a strategy to stay current with IC-related activities.

Arsenic in Soil

- Bob Campbell will provide a summary of information from a study of arsenic bioaccumulation and chemical speciation to help identify potential site uses.

Air Field Support

- The Forum is specifying no action at this time on the issue of ensuring that risk assessments include certain activities occurring around air fields, such as farming and day care centers.

Non-NPL Sites and DoD Budget

- It is important to understand the POM budget process within DoD, since it is the mechanism by which DoD earmarks money for environmental restoration. Other than obtaining access to, and developing an understanding of, the POM budget, no action is called for.

USDA Grain Bin Sites

- Meghan Cassidy will obtain a list of federally owned grain bins.

Spring Meeting

The Ground Water Forum will take the lead and set the agenda for the Spring 2000 TSP meeting to be held April 25-28 at the Wyndham Hotel in Washington, D.C. The meeting will include a joint training session on phytoremediation presented by OSWER. Additional topics for the agenda will include: joint USACE papers, updates on ecological risk, the oxygenates issue paper, USACE cooperative projects, the construction manual, membership participation update, landfill reuse guides, and Forum goals and progress. Other possible topics for the meeting may include a follow-up on the presentation on landfill redevelopment, treatment of oxygenates and PCBs, and a brief guidance update from headquarters. The FFF will continue planning for this meeting during the conference calls, and people should raise suggestions at these times.

Fall Meeting

The FFF will take the lead in organizing the fall TSP meeting. Although a location city has not been selected, the following have been suggested: Charleston, New Orleans, San Diego, the Bay area, and Seattle. It is likely that this meeting will include training by the National Ground Water Association, probably in geostatistics or geochemistry.

Meeting Debrief

Co-chair Paul Leonard asked for feedback on the business sessions.

Positive aspects expressed by the group included:

- Forum activities were broken up with workshops
- Discussions were open
- Field trip was useful and interesting
- It was useful to hear FFRRO's perspective on a variety of issues of interest to the Forum
- An opportunity for a fair hearing of state concerns
- Project management course (perhaps this could be tied into a certification program)
- Regional round-up
- UXO documentation was good
- Discussions on institutional controls
- Location was good

Negative aspects expressed by the group included:

- The scheduling of concurrent sessions lead to conflicts in peoples' schedules.
- The Engineering Forum Roundtable had too many speakers, which caused them to water down their presentations
- The DOE presentations were obscure and self-promotional
- Vadose zone site technology
- Need more feedback on current activities and issue resolution in EPA

The co-chairs will prioritize the regional round-up issues and ensure that follow-up to the most critical topics takes place. A short list of these issues will be developed and distributed prior to the next TSP meeting. During future teleconferences, the Forum will discuss further some of the specific issues identified during the meeting.

UXO Subgroup

Harry Craig (Region 10) opened the meeting by noting that several important issues arose during Wednesday's regional round-up, particularly those issues relating to site characterization and search methods. He mentioned that EPA has made progress in determining data quality objectives relating to the range rule, but still has a long way to go in terms of field implementation guidance and deciding what constitutes enough characterization. Typically 1% or less of a site is characterized. Although near 100% characterization is preferred, it's not practical given the limited financial resources. He then opened the meeting to comments.

National Issues

Working with the USACE

Steve Hirsh asked about the ups and downs of entering into a formal agreement to work with the U.S. Army Corps of Engineers (USACE) on UXO issues. He suggested inviting USACE representatives to the Spring 2000 meeting for a day of discussions.

Doug Bell said that the idea of entering into an agreement with the USACE is basically sound, but urged caution. Although negotiations inside the Beltway have been moving swiftly, there have been some discrepancies concerning the USACE's implementation of statistical sampling and estimation methods.

Wynn agreed that Hirsh's idea is very good. One of the topics discussed in management principles negotiations is site-specific agreements. Part of the process involves evaluating any existing agreements that are based on partnership agreements versus legal agreements. To the extent that these agreements can be reached without interfering with HQ operations, she would like to see it happen. Negotiations are stuck on management principles and we must work around the sticking points. Craig mentioned that having legal agreements provides the framework to accomplish this. Enforcement tools are needed when negotiations break down. Wynn noted that the management principles are based on these agreements which are always very broad; the sticking points are in the details. Management principles are supposed to be a framework for everyone to work together on these UXO facilities, regardless of whether they are on the NPL or not.

Statutory Framework and Authority Issues

Wynn discussed the statutory framework and authority questions, noting that both of these topics were under fire. EPA is asking DoD, which has emergency removal authority, to notify regulators (states, tribes, EPA) if they are performing a large number of emergency actions at a site. DoD needs to assess the implications of these emergency actions because they may be in a better position to do a long-term remedial action or a non-time critical removal. EPA perceives that DoD is using their emergency authority or time critical authority to skirt regulatory involvement and public participation, although DoD denies this. EPA would like to build a framework that will force DoD to notify regulators in a meaningful manner that is not overly burdensome. DoD seems to be moving toward agreeing with this, but it always comes back to "what if EPA or the state disagrees with what DoD is reporting?" DoD does not care to acknowledge EPA's eminent and substantial endangerment removal authority.

In terms of enforcement, EPA's position is to enter into site-specific *enforceable* agreements wherever it makes sense. EPA has not reached the point of determining what authority these agreements would be created under. DoD is not happy with this enforceability idea; hence, this issue is one of the big sticking points. Both the statutory framework and enforceability topics must be addressed before moving forward with the other issues.

The Importance of Public Participation

Wynn noted that public participation is essential. Citizens are angered by the services' clandestine approach to UXO. The services claim there is no problem. There is definitely a trust issue. The public needs timely, accurate, and easily understandable information. DoD headquarters needs to get more involved.

Over Reliance on Institutional Controls

Wynn said there is an over reliance on institutional controls (ICs) with regards to UXO. EPA hasn't gotten into IC discussions yet because it hasn't been apparent how regulatory oversight works. Craig mentioned that they have been using the 3-tiered NCP approach, using treatment first, access control second; and ICs third. ICs are used when contamination is too deep or too expensive to clean up. It is not meant to avoid clearance, but that is the way it's being used. Enforceability of ICs is very location specific.

Many reusers and future land holders don't want the responsibility or liability associated with doing business on a potentially contaminated site. Many ask for full clearance, but EPA cannot guarantee 100% clearance because of technology limitations.

Wynn mentioned that the services should not allow the most contaminated sites to be developed. The services should make resources available to guard their fences.

Thomas Smith (Region 5) noted that one example where unguarded fences are ineffective at keeping out civilians is Jefferson Proving Grounds in Indiana. Locals cut through fences and enter the contaminated area to go horseback riding or deer hunting.

Jim Kiefer (Region 8) has experience working with developers to address this problem in the deed. Zoning doesn't work as well as it should in small communities. It will only work in a large city with an extensive zoning staff. Once sites are partially cleared and turned over for redevelopment, digging foundations and putting in swimming pools could be disastrous if ICs aren't strictly enforced. Bell mentioned Spring Valley in northwest Washington as an example. This site wasn't supposed to be fully developed, but now it's one of DC's poshest suburbs.

Bob Campbell (Massachusetts Department of Environmental Protection) agreed, noting that in Massachusetts, ICs lack credibility because there is no enforcement. Massachusetts does not abide by ICs unless there is a provision in the ROD that says that if the conditions change in any way, the PRP must revisit the issue.

Craig also noted that it is destructive to clear and dig. The cost is also prohibitive; it cost $1 billion to clear (dig and sieve) 3 square miles to 20 feet. Hirsh mentioned that one can spend $1 billion to clear a site and still need institutional controls to cover liability. What kind of enforcement can be assigned to ICs? Bell then questioned the value of ICs, particularly if land use changes. He remarked that DoD has agreed that if land use changed and additional clean up was necessary, then they would reopen discussions.

Miscellaneous Issues

Wynn discussed the last three technical issued being dealt with in the management principles: (1) encouraging DoD to use more innovative technologies; (2) the consistent application of DDESB standards; and (3) the range rule 3 (R3M), which was taken out of the management principles altogether. It now stands on its own as a separate entity. Wynn is not 100% confident that there will be a clear-cut framework to give to the field to work on. Progress is dependent on EPA's ability to work with the services or the USACE and arrangements that can be made without any interference from HQ and policy-makers. Boundaries and expectations are needed for successes.

Wynn asked the UXO group to prioritize their needs in the field.

Regional Needs

Is UXO a CERCLA Hazardous Waste?

Craig posed a question that has been raised many times in Region 10— is UXO a CERCLA hazardous waste? Several regional representatives agreed that this was an important question and asked why it hasn't been answered. Bell noted that most of the components in UXO are listed as hazardous substances. The issue revolves around whether we can move forward and say that UXO–as a class of substances–is hazardous; this is a contentious point. In June 1998, the D.C. circuit court upheld the munitions rule, meaning that UXO is potentially subject to regulation as a statutory solid waste under RCRA.

Craig mentioned that the munitions rule says that waste munitions are statutory solid waste and are a hazardous waste if they exhibit the characteristics of ignitability, reactivity, toxicity, or corrosivity. Almost all munitions are either ignitable, reactive, or have lead constituents in them. Therefore, UXO is a RCRA waste that is a subset of a CERCLA hazardous substance.

Bell then asked whether UXO that do not contain hazardous substances and are not ignitable or reactive are hazardous wastes. Some UXO is totally inert, and would not be classified as hazardous, so a determination has to be made as to whether a particular UXO is hazardous or not; we cannot simply classify all UXO, categorically, as hazardous.

Craig then asked how you can not classify a substance that, by design, was intended to kill people and destroy structures as hazardous. Wynn proposed that this issue be addressed in an official memo. Bell added that the Office of General Council must agree that the majority of UXO, but not all, may be hazardous.

Hirsh alluded to the RCRA model, saying that the same process may work for UXO (i.e. when the item is disposed of, its regulatory status changes). Bell remarked that the installation must declare it waste. It is not waste when used for its intended purpose via the munitions rule.
Craig suggested that when UXO is decayed, damaged or decomposed, it clearly becomes waste. Bell said that EPA is having difficulty getting beyond the stumbling block with the range rule. Uncertainty is a major problem. Hirsh said that any uncertainty about what is buried at a site creates problems.

Craig mentioned that another CERCLA problem is that DOJ hasn't signed off on the 106 Order for UXO, but noted that an agreement is closer. The only other mechanism available is a RCRA 30-13 or 7003 Order for offsite, but that cannot be used on the range. The Safe Drinking Water Act Orders have also been used in the past.

Wynn then brought up the issue that the FY 2000 appropriations bill limits EPA's authority: "penalties on SEPs cannot be paid by the federal government." This basically negates the Federal Facilities Compliance Act in regard to the Safe Drinking Water Act, RCRA, and the Clean Air Act.

ACTION ITEM: The regions and enforcement office will draft a memo asking the OGC's opinion whether UXO is a CERCLA hazardous waste.

Is DDESB Chapter 12 on ARAR?

Craig remarked that another pressing issue for Region 10 is whether Department of Defense Explosives Safety Board (DDESB) Chapter 12 is an Applicable or Relevant and Appropriate Requirement (ARAR). Region 10 Office of Regional Council has examined the issue and, based on the language in the implementing regulations for DDESB, what's in DoD's own directives, and what it says with regards to enforceability of those directives, ORC believes that it is an ARAR. A lot of discussion comes down to what constitutes adequate site- specific information. There are numerous times when EPA disagrees with the USACE on this issue.

Bell agreed that EPA often disagrees with DoD, and that EPA's role in this matter is not clearly defined. The USACE claims it is not an ARAR. HQ will continue to press this issue.

ACTION ITEM: Get information to Federal Facilities Forum and then distribute it in the regions. Bell will work with Wynn on pressing forward with the issue.

Training Materials

Craig mentioned that another issue that deserves attention is the creation and dissemination of training materials for RPMs. A hour and a half long module for the Federal Facilities RPM Corps is being developed. TIO is also developing a plug-in module for the field-based site characterization course on geophysics and field analytical methods for UXO.

Wynn said that DoD is willing to train some EPA regional personnel, including managers and RPMs. They have made an offer to set up an exchange, and we would like to suggest specific training to them.

Craig said the UXO Handbook should include such topics as ordnance 101, how to screen for residue, how to complete site close-out, geophysics, etc. Wynn told Craig to send a proposal to HQ outlining topics he wants to include. We should consider spending resources to design a UXO course. There will be gaps because all of the information is not complete. We must work together with DoD to reach middle ground.

Hirsh agreed that this handbook could be an olive branch and DoD has a lot to contribute. A training course should accompany the handbook. Bell noted that contractors are working on major sections of the handbook right now.

Wynn told the group to get ideas down, refine what we want to try for, put some contractor money around it, and get the ball rolling. Craig cautioned that the handbook must be peer reviewed. Bell said that the draft handbook should be ready by December; the final version should be complete by April/May of 2000. Wynn suggested enlisting a contractor's help to ensure that the handbook includes strong principles.

ACTION ITEM: Continue working on Handbook and Training Course.

Lead Agency at FUDS

Hirsh asked who the "Lead Agency" at Formerly Used Defense Sites (FUDS) is. FUDS with UXO is a complicated issue that is arising in many regions. Craig mentioned that FUDS don't have future users who are concerned about their condition; they often slip through the cracks. This issue will also be affected by the range rule. EPA will continue to look into this issue.

Cooperation with the Military with UXO Site Characterization

Tom Smith (Region 5) brought up the military's lack of cooperation with UXO site characterization. The military often totally ignores site characterization or does one or two percent clearance. For example, at Jefferson Proving Grounds, there is no cooperation between the miliary and other agencies. There are also documentation problems. Despite the fact that Jefferson Proving Grounds is a test bed for new technology demonstration, they are not using this new technology to do site characterization. Craig noted that he has encountered the same problems with the Navy. The Navy is not apt to characterize areas that have no reuse potential.

Bell claimed that DDESB is overwhelmed because it is a small organization. He noted that EPA's goal is not specified. We will move forward on the Issue Paper.

We must take small steps, moving ahead slowly. There is no "short term". Costs associated with UXO are mind-boggling. We must prioritize the worst sites and work on them first. A large part of the battle is determining which sites are in the worst shape.

Bell remarked that DoD is charged with protecting the nation, and it is difficult for them to effectively clean up sites with no additional funding from Congress. Congress must be appraised of this. 1,900 FUDS are known or suspected; these sites could be used as a starting point.

Grid Stats Site Stats

Bell mentioned that EPA has been asked by the USACE to take a closer look at grid stats site stats from the standpoint that RD is frustrated by EPA Regions because they say that it doesn't make any sense using it. They want EPA to disprove this. EPA cannot use funds to disprove things that were done by a contractor without peer review; Bell suggested that EPA review this to see if this has any utility. Ashok Singh (NERL-Las Vegas) is working on this now. It appears as though this technology will not be able to help anyone in the near future. We must work with USACE to get things done. Most information has been slow in coming.

Bell said that the issues concerning statistical sampling and risk estimation procedures developed by the USACE have been a hot topic of negotiations since the July 22nd meeting. Since then, there have been

nine 3-hour meetings. Disagreements will continue at a regional/ site-manager level until EPA gets a better understanding of the utility of this method. Pre-emptive guidance will help until some other decision is made. There are statisticians reviewing the data that we have. Once the data is complete, we can make suggestions.

GROUND WATER FORUM

Draft Guidance on Monitored Natural Attenuation

Doug Yeskis (Region 5) summarized EPA Region 5's efforts to develop Region-specific guidance on the use of monitored natural attenuation (MNA). Yeskis is part of the workgroup developing the *Region 5 Framework for Monitored Natural Attenuation Decisions for Ground Water*. He distributed copies of the most recent draft framework (dated October 12, 1999) and asked that the GWF provide feedback on the draft.

The workgroup set out to produce a short document that would be more useful and user-friendly than EPA's *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water*. To that end, the workgroup wrote the framework in "plain language" so that it can be understood by non-engineers and geologists. The framework provides the minimum technical requirements for evaluating the applicability of MNA decisions. Like the technical protocol, this framework addresses ground water (not soil) contamination, but has been expanded to include all compounds, not just chlorinated solvents. The framework *does not* address long-term monitoring, source control issues, contingency remedies, data evaluation.

Yeskis noted that the framework refers to the following three "lines of evidence," or supporting site-specific information, to demonstrate MNA:

- *Primary category of information*: Historical ground water and/or soil chemistry data that demonstrate a clear and meaningful trend of decreasing contaminant mass and/or concentration.

- *Secondary category of information*: Hydrogeologic and geochemical data that can be used to demonstrate indirectly the type(s) of natural attenuation processes and the rate at which such processes will reduce contaminant concentrations.

- *Supplemental category of information*: Data from field or microcosm studies which directly demonstrate the occurrence of a particular natural attenuation process at the site.

Figure 1 of the framework is a flowchart for MNA decision-making. This flowchart was adapted (with modifications) from the *ASTM Standard on Remediation by Natural Attenuation*. The workgroup tied the framework text to the flowchart by referring to individual boxes within the flowchart where possible.

Table 1 of the framework is a modification of Table B.1.1 in the Technical Protocol. It describes the major processes affecting contaminant concentrations. Yeskis indicated that the framework distinguishes between destructive (e.g., abiotic degradation, biodegradation, and radioactive decay) and non-destructive (e.g., advection, dispersion, and volatilization) processes and tries to emphasize the destructive ones. Process affecting non-volatile compounds such as metals and radioisotopes are included in Table 1. Tables 2 (Required Field and Laboratory Indicator Parameters) and 3 (Data Uses of Indicator Parameters) are currently in very rough draft form.

The workgroup would like to produce a final draft by the end of the calendar year in order to present it to outside reviewers. The framework would then be finalized in Spring 2000 and would serve as Region 5 guidance.

Action Items Review

Action Item	Action	Current Status/Planned Action
(1) FY02 ORD research priorities	The GWF will work on the priorities for FY02 during future conference calls and on the electronic bulletin board. In the future, the priorities should be developed at the Spring TSP meetings	Done. The GWF developed a list of FY02 research priorities during the afternoon business session on October 28.
(2) Ground-Water Sampling Guidelines Paper	Bernie Zavala and Doug Yeskis will complete the SOPs by July 15. The GWF will review the draft paper and submit comments to Zavala or Yeskis by September 1, 1999. The workgroup will revise the paper by November 1.	The workgroup has incorporated comments and finalized the guidelines. Zavala will send the SOPs to the workgroup for review by Dec. 1. Zavala will incorporate the workgroup's comments, and submit the SOPs to the Forum by February 1, 2000 for review.
(3) Electronic information bulletin board.	The bulletin board is operating, GWF members should access it and start using the bulletin board for communications including posting agendas, minutes, action items, and workgroup members.	GWF members are still relying on e-mail rather than bulletin board communications. As a test, and to promote the use of the bulletin board, the GWF will comment on the working drafts of the Time Frames and Construction Completion Issue Papers using the bulletin board. The Ground-Water Sampling Guidelines Paper will also be archived on the bulletin board with other GWF documents.
(4) Action items list	The Co-chairs will distribute an updated action item list by August 1. Action items should identify contacts/responsibilities and time line.	Done. Action items were distributed as part of meeting minutes. There was no separate distribution.
(5) Contaminated Aquatic Sediment Remedial Guidance Workgroup (CASRGW)	Dave Drake will keep the GWF informed of progress and future activities of CASRGW, whose goal is to develop Superfund guidance addressing sediment sites.	Continuing. The 1st rough draft of the guidance is complete, but is not ready for external review. CASRGW will meet in Washington, DC, November 8-11 to assess and revise the draft.
(6) Ground Water/Surface Water Workshop	The draft summary report will be completed for forum review by December 1, 1999. The workshop documents will be posted on CLU-IN. The Ecological Risk Forum has proposed a joint research initiative and requested GWF support.	Continuing. The workgroup will complete the draft summary report by February 1. Bruce Duncan (Region 10) has written an article with an ecological perspective on GW/SW interactions (to be posted on the bulletin board by January 1). Dick Willey agreed to contact Duncan for details on the initiative.
(7) Uncertainties in Time Frames Issue Paper.	Vanderpool agreed to contact Izraeli for the status of the outline. Kay Wischkaemper, Kathy Davies, Helen Dawson, Vince Malott, Dave Wilson, Luanne Vanderpool, and Kevin Willis volunteered to join the workgroup to review the outline.	Comments on outline submitted to SPRD-Ada in June. Ruth Izraeli recently received the 1st draft from Dave Burden. She will forward the draft to the committee members for review. Comments should be submitted to Izraeli by December 1, 1999.
(8) Monitoring of Field Parameters Issue Paper	SPRD-Ada is drafting a revised outline. The draft outline will be distributed to the GWF at the end of June 1999.	SPRD-Ada sent draft to the workgroup for comment on September 1. SPRD-Ada will produce a second draft to send to the whole forum.

(9) Data Usability Issue Paper	A workgroup must be formed to review the outline and the draft paper when available. Rich Freitas volunteered to assist Ernie Waterman.	No further action. NERL-Las Vegas proposed that some publications being developed would satisfy this. The GWF will withdraw their issue paper request.
(10) Site Characterization for MNA of Chlorinated Solvents Issue Paper	The first draft is a bit "wordy" and will be revised by SPRD, Ada.	Revision completed. Bill Brandon (chair), Herb Levine, Dave Kargbo, Dave Petrovsky, Jeff Johnson, and Doug Yeskis volunteered to review it.
(11) Extraction/injection wells paper	Kathy Davies will contact Steve White (USACE) for its status and report back to the GWF via the electronic bulletin board.	No action yet. Davies will contact White and report back to the GWF soon.
(12) OERR's Direct Push Technology Workgroup	Zavala will report back to the GWF on the workgroup activities. The draft study being prepared by Kansas DHE comparing metals data collected from DPT and monitoring wells drilled using hollow stem augers is due at the end of June 1999. Zavala to share it with the Forum when available.	Continuing. Have limited the workgroup to addressing ground-water sampling issues. Dave Nielsen was asked to address technical issues. States are being surveyed on the use of DPT. The workgroup will be moving forward later this winter. Zavala will keep the GWF informed.
(13) Guidance on Long-Term Monitoring for MNA	Herb Levine, Roseanne Sakamoto, and Steve Mangion are writing this guidance document with support of co-authors from NERL-Las Vegas and SPRD-Ada. The GWF will review the draft in the Fall of 1999.	The draft document is almost ready for review. By February 1, 2000, the document will be available for GWF review.
(14) State Participation in TSP	Done. The Co-chairs will propose bylaw revisions reflecting state participation and will discuss issue of states voting with the co-chairs of the Engineering and Federal Facilities Forums.	Co-chairs and Steimle have developed a draft white paper "State Participation in the Technical Support Program." Steimle and co-chairs met with state participants to discuss the draft. Steimle will incorporate comments and finalize the white paper.
(15) Remediation Technologies Development Forum training "Enhanced Bioremediation of Chlorinated Solvents	Review slides for this training class; available on Internet in August; Review dry run-probably in October in California.	Vince Malott attended a dry run in Baton Rouge and made his regulatory presentation using the slides provided by Ken Lovelace (OERR). The California dry run has not been held yet. A Region 9 GWF member is needed to make the presentation.
(16) Monthly Conference Calls	Co-chairs will restructure monthly conference calls in order to increase discussions. Bill Brandon to identify a technical issue for discussion during each call.	Done. The GWF likes the new format. Technical issues must be identified further in advance of calls, however. In the future, topics should be forwarded directly to one of the Co-chairs.
(17) Status of Ground Water Cleanup	Lovelace will distribute write-up of his presentation from St. Louis meeting	Done
(18) Inactive "members"	Regional members will contact inactive members in their region to confirm interest in continuing to participate.	No action yet.
(19) Travel Support	Curt Black will discuss the possibility of additional travel support (particularly for RCRA members) with Rich Steimle	No action yet. Black will contact Steimle and report back to the GWF.
(20) Marketing GWF	Kevin Willis will work with Diane Dopkin to update the TSP brochure and pursue other avenues to market the GWF.	Continuing. Need to locate electronic copy of the TSP brochure.

(21) Strategy for Post Construction Completion Sites and O&M	Dave Wilson, René Fuentes, Kay Wischkaemper, and Kathy Davies will form a workgroup to examine the shift in focus of Agency programs toward O&M and post construction completion sites. Wilson will chair. Workgroup to meet by teleconference by September 1.	The Workgroup is still working on the structure of the strategy. They will report back to the GWF during the December conference call.
(22) Ground Water Monitoring Technical Guidance	Review outline of OSW's Ground Water Monitoring Technical Guidance	Review done. Maraldo coordinated comments and sent them to OSW. Maraldo will post new comments on the electronic bulletin board.
(23) MNA of Contaminants in the Subsurface Issue Paper	Review Issue Paper developed by SPRD-Ada	Review done by T. Aalto, J. Canova, J. Johnson, H. Levine, R. Muza, L. Vanderpool. Comments coordinated by Vanderpool. Paper retitled "Microbial Processes Affecting MNA of Contaminants in the Subsurface" and published. Available on the Internet.
(24) Electronic groundwater data and databases	Ruth Izraeli is soliciting contacts in regions collecting data electronically and using groundwater databases.	Done. Izraeli received feedback from Regions 5 and 10. Moving forward.
(25) National tracking progress/effectiveness of RCRA corrective actions with hydraulic control	Fuentes to develop brief problem statement; to be discussed in next (November?) Conference call.	No action yet.
(26) Pump and Treat Case Studies	Linda Fiedler (TIO) will be requesting review when document completed.	The document is complete and on the Internet.
(27) In Situ Bioremediation of Chlorinated Solvents	Linda Fiedler (TIO) will be requesting review when document completed.	Vanderpool will contact Fiedler for the status of the document.
(28) Effect of microscale vs. macroscale characterization on risk exposure assessment	Kathy Davies, Bernie Zavala, René Fuentes, and Jeff Johnson to subdivide and flesh out components of this high priority issue by October 30.	The workgroup has held two conference calls and one meeting to discuss the issue. The workgroup will send their proposed outline to the GWF for review by November 15.
(29) Issue of contaminated ground water discharging to surface water-MNA or ACL	Ken Lovelace to present policy on issue during September conference call	No action yet.
(30) Issue of Indoor Air	Helen Dawson to scope issue (Quantifying volatilization of VOCs from ground water to the vadose zone and indoor air) and assemble workgroup	Status uncertain.
(31) Co-Chair Election	Election is November 4	Regions must submit their votes to Diane Dopkin for either Kathy Davies or Vince Malott by December 1, 1999.
(32) Quality Assurance Guide for Superfund Remedial Actions	Review requested by Steve Luftig (OERR), due by November 15(!)	Continuing. See: http://intranet.epa.gov/oerrinet/review/index.htm

(33) Historical information on chlorinated VOC plumes	The GWF was invited by Lawrence Livermore National Laboratories to contribute historical information on chlorinated VOC plumes for a database.	The GWF will not pursue this action item as a forum. Members can fill out these forms and submit to LLNL individually.

Passive Diffusion Samplers

Dick Willey (Region 1) moderated a discussion of the use of passive diffusion samplers. Don Vroblesky of the USGS made a presentation entitled "Low-Cost Diffusion Samplers for VOCs in Ground Water," and Paul Hare of General Electric Co., Corporate Environmental Programs, made a presentation entitled "Practical Aspects of Passive Bag Sampling for Monitoring VOCs in Ground Water." The presentations were followed by a question and answer session.

Low-Cost Diffusion Samplers for VOCs in Ground Water

Don Vroblesky (USGS) explained that there are two types of diffusion samplers available: vapor-filled samplers that are used for sampling in ground-water discharge zones, and water-filled samplers used for sampling in monitoring wells.

Vapor Diffusion Samplers: Vapor diffusion samplers are constructed very simply using an empty test tube, heat-seal, lay-flat tubing, and two polyethylene bags. The vapor diffusion samplers are buried in sediment where ground water is upwelling. When ready to sample, the sampler is withdrawn from the sediment, the outer bag is cut off, and a cap placed over the inner bag and test tube. The vapor sample is taken to an onsite laboratory for gas chromatograph analysis

Vroblesky first used vapor diffusion samplers at a site in Greenville, South Carolina, to show the distribution of VOCs in fractured bedrock which was thought to be contributing to contamination of a nearby creek. TCE had been detected in the creek, but the source fracture zones were not known. In order to remediate the creek, contaminated bedrock fracture zones discharging to the creek had to be located.

Rather than use the hit-or-miss approach of installing monitoring wells to locate the problem fracture zones, vapor diffusion samplers were installed in the stream. The samplers were installed upgradient, cross gradient, and downgradient of the TCE plume. Three areas of upwelling with high concentrations of VOCs were detected. This information was compared to electromagnetic anomaly data showing bedrock fracture zones, and the specific fractures where the TCE discharges were occurring were identified. Pumping wells were installed in these fracture zones. While drilling the wells using air rotary rigs, bubbles welled up in the stream further indicating a connection between the fracture and the stream.

The pumping wells have prevented further discharge of contaminants to the stream, and the stream is now clean. The pumping wells have not been turned off yet, however, because the ground water has not yet been cleaned up.

At a second site, the Massachusetts Military Reservation, divers installed lines of vapor samplers to investigate whether chlorinated solvents were discharging to Johns Pond. TCE was detected in the upwelling ground water 200 feet from the shoreline. Two separate plumes were identified. The presence of TCE was confirmed by offshore drilling.

Water Diffusion Samplers: Vroblesky compared water diffusion samplers to a head space analysis of an aquifer. He noted that water-filled samplers placed beneath stream beds yielded the same

concentrations as the vapor-filled samplers. Water-filled samplers can be used to determine actual ground water concentrations of contaminants. The samplers are placed in monitoring wells until they reach equilibrium. The samplers are then withdrawn and analyzed.

Concentrations of contaminants inside the samplers have been found to be comparable to conventional ground water samples, except for very soluble compounds like MTBE. Using diffusion samplers in a well has the benefit of avoiding well purging before sampling. The samplers can also be used to target certain horizons in the aquifer.

Water diffusion samplers were used at Hanscom AFB to measure VOC concentrations in bedrock wells with 30-foot screens. Several samplers were tied along a weighted stainless steel line that was lowered across the 30-foot interval. The samplers were left in the well for about 2 weeks before analysis. Differences in concentrations across the interval were observed. The sample results were pretty comparable to those obtained by low-flow sampling methods. Similar results were obtained at sites in Louisville, Kentucky and Davis, California. Overall, concentrations measured in the diffusion samplers were lower than those measured with low-flow samplers because the flow-through assumption becomes less valid with a longer well screens.

Sampling Issues: There are two main sampling issues associated with passive diffusion samplers: 1) How long should they be left in place? and 2) How long are the samples stable? Laboratory studies of the use of passive diffusion samplers to sample benzene and TCA have shown that water diffusion samplers take about 48 hours to equilibrate. However, MTBE did not equilibrate after 150 hours. MTBE can be detected in the samplers, but not in representative amounts. This disparity is attributed to MTBE's very high solubility.

Vroblesky pointed out that laboratory conditions do not match conditions encountered in the field. For example, equilibration will take longer in silty materials. To determine how long equilibration will take, the borehole dilution method is used. The water in the monitoring well is replaced with distilled water and the time it takes for conductivity to return to the initial reading is measured. Equilibration usually occurs very fast for karst as well as sand and gravel.

In regards to the second issue, vapor sample concentrations usually drop off after several hours, but if samples are analyzed after several minutes, little change will occur. Water sample concentrations are also stable for about one hour; however, concentrations of some compounds drop off after about a half hour. To minimize the loss of concentration, samples must be capped immediately and placed on ice.

In summary, Vroblesky said that passive diffusion samplers yield results comparable to conventional sampling methods. The samplers are applicable to a variety of situations, and can sometimes eliminate time-consuming and expensive well purging.

Practical Aspects of Passive Bag Sampling for Monitoring VOCs in Ground Water

Paul Hare (General Electric Co.[2]) summarized some of the practical aspects of using passive diffusion samplers. He noted that the downhole passive water sampler and method of sampling were patented by Don Vroblesky (USGS) and William T. Hyde, Jr. (GE) on September 8, 1998 (U.S. Patent No.

[2]The views expressed are the presenter's and do not reflect those of the General Electric Company.

5,804,743). The license agreement between the USGS and GE became effective on June 23, 1999. The USGS has sole and exclusive right to grant sub-licenses to others.[3]

Hare explained that an underlying concept for the representativeness of passive water samples is that water within the open section of a well is usually fresh. Therefore, purging is not necessary to get representative samples from most wells.

Contaminants are often stratified within the open section of wells. This stratification may reflect the distribution of contaminants in the adjacent strata. Or the wells may be self-mixing (e.g., vertical flow) under ambient conditions. Passive water samplers are able to show stratification. With the exception of properly collected low-flow samples, samples collected by conventional purge methods cannot show stratification and therefore results may not be comparable.

Another underlying concept is that VOCs can diffuse from the well water into deionized water inside a polyethylene bag placed within the open section of the well and eventually reach equilibrium. Hare indicated that he has generally adopted a *minimum* diffusion period of 14 days, although laboratory studies indicate that equilibrium may be reached more quickly for many VOCs.

Hare said there is no *maximum* diffusion period since the concentration of VOCs in the bag represents an integrated value over only the most recent time. Rather, deciding on the maximum period to wait will likely depend on the monitoring program, economics, and other factors, such as the condition of the bags. Hare indicated that he has used 90-day and even 365-day diffusion periods.

Another underlying concept is that diffusion through the polyethylene takes place in the vapor phase. Vapor pressures can be an important factor for VOCs with low solubilities. But VOCs with very high solubilities may be problematic regardless of vapor pressures.

USGS and GE are performing laboratory tests to see if passive diffusion samplers work for various VOCs. Pilot tests are also providing useful information. A few VOCs have been found to diffuse into the bag more slowly and may not reach equilibrium within a reasonable time frame. In one laboratory study, acetone only reached 20% of equilibrium after 10 days.

There are several advantages to using passive diffusion samplers. Using them is simple and straightforward, and the need for specialized field equipment is reduced. They cost less than other sampling methods and can reduce monitoring costs by more than 50% at some sites. Waste generation also is greatly reduced; as a result, many sites in long-term O&M could get to CESQG status. The method also can dramatically reduce the impact to communities where wells are being sampled because less time is needed and no drums of purge water are left behind. Their use improves repeatability between sampling events, and contaminant profiles can be obtained in wells with longer open sections.

There are also limitations to passive diffusion samplers, however. Currently, they cannot be used for other fractions (e.g., SVOCs, pesticides, PCBs, and metals). Therefore, they typically are not worth using if numerous wells must be sampled during the same event for these parameters using other methods. In addition, diffusion rates may not be quick enough for a few VOCs, such as acetone and MTBE.

[3]For more information on sub-licensing, contact the USGS in Reston, Virginia, at (703)648-4450.

Pilot tests were performed at six sites, and the results of passive diffusion sampling were comparable to those of the approved sampling method. The passive bags are now being used on a long-term basis at all six sites with the approval of the regulatory agencies. The regulators expect passive bags to produce results comparable to those of approved methods. Otherwise, they will not likely approve their use. At some pilot test sites, approval of the passive bags was conditional. Hare added that USGS and GE even proposed some of those conditions to facilitate approval.

Hare is using passive bags at a voluntary remediation site in Indiana without pilot testing. The main contaminant is TCE for which ample data are available to support the use of passive bags. Results from the passive bags benchmarked very well with historical results.

To conduct a pilot test, Hare recommended the following approach:

- Review your monitoring program to ensure that you have a viable application for passive bags. Design the test to maximize your results and attempt to control or limit sources of variation that are not associated with passive bags (e.g., laboratory analyses). Consider the hydrogeologic setting, well construction, water levels, etc. Select wells thoughtfully (e.g., to sample the full range of concentrations), and consider the nature of the approved sampling method.

- The requirement to perform pilot testing and include all wells in the pilot is probably not necessary at most sites. Even at sites where pilot testing was performed, it is rare for all of the wells to have been included—especially when new wells are included in the monitoring program after the pilot testing was completed.

- Quality control is important in bag preparation. Use deionized water from the laboratory that will perform the analyses. Minimize the headspace in the bags. Store and transport them to the site in a chilled cooler and place them in the wells as quickly as practicable. Avoid bias and have a good consistent logic for bag placement. If low-flow sampling is the approved method, obtain those samples from the same depth as "stressless" as possible. Watch out for partially saturated well screens and ensure that bags are set below the water throughout the diffusion period.

- Allow for a sufficient and constant time (e.g., 14 days) for diffusion. There is no significant benefit to testing different diffusion times, but if you do, stagger the installation of the bags so they can all be removed on the same date. For each well, make sure that the conventional sample is collected within a few hours after the passive bag sample.

- The chain-of-custody should be orchestrated to ensure that passive bag and conventional samples for each well are handled and analyzed similarly to minimize analytical variability. Collect quality assurance samples including blind duplicates for both sampling methods—perhaps at a frequency more than standard. Submit trip blanks with each shipment.

- Finally, take good field notes and evaluate all of the data, not just paired detections. Consider the significance of the data, especially differences. Don't set the bar too high.

Hare followed up his explanation of the approach to pilot testing passive diffusion samplers by summarizing the results of an example pilot test at a site in New York. The summary included an analysis of the data collected.

Questions and Answers

Question: Can the samplers be used for cyanide?

Answer: Yes. And research at a site in Minnesota is being conducted to see if materials other than polyethylene will work for other inorganics such as metals.

Question: Can they be used for dissolved oxygen (MNA applications)?
Answer: Yes.

Question: What volume of sample should be collected?
Answer: The amount need to run the analysis.

Question: Are you going to get a license to sell the samplers?
Answer: I'd prefer that all consulting firms had the license cheaply; otherwise, the samplers won't be widely applied. It's important to see the samplers in wide use.

Question: If the USGS installs the samplers at our site, do we need a license?
Answer: If it's a military or other government site, no. If it's a commercial site, I'm not sure.

Question: On your data comparison charts, some R^2 values were very high. What does an R^2 of 0.97 mean, for example?
Answer: It's difficult to tell whether 0.95 or 0.97 is good enough. That's why blind duplicates and looking at false positives and negatives are important.

Question: How are diffusion samplers better than peepers and seepage meters?
Answer: They are easier to use. The analytics are less complicated. Peepers are good instruments, but they're primarily for inorganics.

Question: Is low-density polyethylene inert enough to use in wells? Have you observed any leaching?
Answer: We did not look at this, however, passive bags probably shouldn't be used at sites contaminated with plasticizers.

Question: Have protocol been developed for the use of passive bags?
Answer: Protocol for the use of water-filled diffusion samplers at military bases is being funded by AFCEE. The protocol was scheduled to be published in November 1999, but was delayed so the Navy could be involved and have sites tested. The protocol will be published no later than Spring 2000.

Conference Call Restructuring

Co-chair Luanne Vanderpool (Region 5) asked the GWF's opinion of the new format for conference calls that was developed during the Spring meeting in St. Louis. The new hour-long format consists of three components: a 20-minute discussion of business- and Headquarters-related issues, a 20-minute discussion of technical issues, and a 20-minute open discussion. The GWF agreed that devoting time to a technical issue each call has been beneficial and should continue. However, it would be helpful if upcoming topics are known in advance so members could poll their regions for information. The GWF agreed that ideas for potential topics should just be forwarded directly to the Co-chairs.

ORD Research Priorities

Dick Willey indicated that he is the only regional representative on the Waste Research Coordination Team (WRCT). The WRCT is in the process of developing FY 2002 research priorities for EPA's Office of Research and Development (ORD). Developing these research priorities helps meet GPRA Goal 5—Better Waste Management. Willey explained that he would like the GWF's opinions on

regional research priorities (as related to the Superfund program) so he can present them the WRCT. He added that there is no formal process for soliciting the opinion of regional technical groups like the GWF, so he is doing so on an ad hoc basis.
ORD's current (FY 2001) priority regional needs are:

- monitored natural attenuation (MNA)
- dense non-aqueous phase liquids (DNAPLs)
- ecological toxicity assessment tools
- ground water/surface water interactions
- methyl tertiary butyl ether (MTBE)
- acid mine drainage

Potential areas of increased or future emphasis were ecological risk, sediments, and other issues, such as the long-term performance of cleanup and containment remedies and high molecular weight compounds. Each of ORD's priority regional needs encompassed several research areas. Willey categorized these research areas as:

1) "Current ORD research that by logical extension could satisfy regional research needs."
2) "ORD research results that may be ripe for technical transfer."
3) "Priority regional areas that are not currently being addressed by ORD."

The GWF then made suggestions for their priorities under each of the three categories:

1) Current ORD research that by logical extension could satisfy research needs.
- ground water discharges to surface water
- monitored natural attenuation

2) ORD research results that may be ripe for technical transfer.
- partitioning interwell tracer tests (PITT)—under the DNAPLs priority
- MNA dispersion/dilution questions—under the MNA priority
- micro vs. macro scales
- applicability of geophysical tools for fractured rock characterization
- uncertainty regarding analytical data interpretation, site characterization, and hydrologic modeling

3) Priority regional areas that are not currently being addressed by ORD.
- contradictions between actual indoor air monitoring results and model predictions—why?

Kathy Davies (Region 3) volunteered to develop a description of the GWF's needs regarding research on micro versus macro scales. Dave Kargbo (Region 3) volunteered to relay to the Co-chairs information on how to obtain a document, prepared by Region 3, that addresses transfer of ground-water and soil contaminants to indoor air. The Co-chairs will forward the information to the entire GWF. The document should be examined to see if it adequately addresses indoor air issues. If not, these could be added to the third category of research needs.

Spring 2000 Meeting

The next TSP meeting will be held at the Wyndham Hotel in Washington, DC, from April 25–28, 2000. The Sunday before the meeting, April 23, is Easter so Monday the 24th will be a travel day. The Forums will meet for a half-day on Friday the 28th.

On the agenda thus far is a joint half-day meeting with Office/Division Directors from EPA Headquarters and a half-day training on phytoremediation to be presented by ORD. This joint session is scheduled for Wednesday, April 26. The remainder of the meeting will be devoted to business sessions and technical sessions that the three forums will plan individually. Vanderpool indicated that there will not be time available to offer one of the NGWA's courses under their state participation contract with TIO.

Several GWF members expressed disappointment that NGWA courses would not be offered. All of the Forums assumed that the courses would be provided because they were asked to vote on their top choices recently. Vanderpool explained that the NGWA/TIO contract specifies that the state participants must choose which courses will be provided. The Forums can voice their preferences, but the decision is solely up to the states. Since the contract provides for two courses per contract year and none were offered during the past year, the states could potentially choose four courses to be offered in 2000. Due to the short Spring meeting week, the Forums will have to wait until the Fall 2000 meeting for the NGWA courses.

In regards to the phytoremediation course, GWF members recommended that the training focus on hydraulic control and performance monitoring. Judy Canova (SCDHEC) volunteered to act as liaison between the GWF and the organizers of the phytoremediation course. Steve McCutcheon (NERL-Athens) was suggested as a presenter at the Spring meeting, and USGS's course on fractured rock was suggested for training.

APPENDIX A
DRAFT FEDERAL FACILITIES FORUM PARTICIPATION AGREEMENT

U.S.. ENVIRONMENTAL PROTECTION AGENCY
~~ENGINEERING~~ FEDERAL FACILITIES FORUM PARTICIPATION AGREEMENT

The following outline constitutes the Mission Statement and Organizational Procedures of EPA's ~~Engineering~~ Federal Facilities Forum:

I. MISSION STATEMENT

EPA's ~~Engineering~~ Federal Facilities Forum provides technical support to EPA Headquarters, EPA's laboratories, and across regional boundaries to the EPA regions. This Forum is comprised of experienced regional ~~engineers and~~ technical professionals, who are knowledgeable and interested in ~~engineering technologies~~ and technical and policy issues affecting federal facilities~~, and who have experience implementing technologies within the EPA administrative and regulatory framework~~. This group performs these functions on a volunteer basis within the regions, in addition to their primary functions and responsibilities. This combination of ~~engineering~~ technical background and practical field experience is a unique resource that is utilized by EPA Headquarters and EPA laboratories to review technical guidance documents, to gather information from regional project managers on various technologies, to identify regional technical support needs and to promote regional consistency. Specifically, the Forum provides:

A. An ongoing communication point of contact between the EPA laboratories, EPA Headquarters and regional Federal Facility personnel by conducting monthly conference calls to discuss regional technical issues and to promote technical transfer between the EPA regions, the EPA laboratories and EPA Headquarters and states. The Forum identifies technical issues to be discussed during the monthly conference calls early so that interested regional staff can plan to attend.

B. Facilitation of resolution of technical or policy problems encountered by RPMs and other interested regional personnel during the Forum's monthly conference call or by identifying appropriate contacts~~ in EPA Headquarters, the labs or the regions~~.

C. Support to EPA Headquarters by reviewing technical guidance documents or policy, gathering information, or identifying technical support and training needs.

D. Promotes ~~technology~~ transfer by interacting with other government agencies, ~~including but not limited to, USAF, USACE, USN, and the DOE~~ to share technical and policy information to take advantage of the research done and the experience gained by ~~the respective~~ these agencies.

E. Promotion and assistance in the development of ~~technical~~ issue papers identified by project managers and permit writers as ~~regional needs~~ needed.

F. Identify future technical and policy support needs as EPA programs change and develop. ~~These needs could include technology transfer to state environmental agencies, other federal agencies or increased technical support to RPMs if contracting budgets dramatically decline.~~

G. ~~Develop and maintain a list of expertise and experience of Forum members to be used by RPMs to facilitate cross regional use of Forum resources. Currently, many sites have entered construction~~

~~and sometimes encounter unexpected problems. The forum in conjunction with other internal support resources can be a valuable tool to solve problems.~~

H. ~~Identify needed RPM training based on RPM input and can assist in training presentations or where appropriate conduct the training.~~

I. Enhance ~~technology~~ transfer of information from our National Meetings by ~~producing either fact sheets, conducting "round table" discussions and disseminating notes from the round table, or issue papers based on a topic discussed in detail at the National Meetings~~ producing and disseminating proceedings.

In summary, the Forum provides a communications resource on ~~Engineering~~ Federal Facilities issues, at the grassroots level, to facilitate technology and policy transfer between other federal agencies, EPA Headquarters, EPA's laboratories, regional personnel, and states.

II. ORGANIZATIONAL PROCEDURES

A. ~~MEMBERSHIP QUALIFICATIONS~~

~~Membership is subject to the approval of the co-chairs and is contingent upon the following criteria:~~

~~1) Each member must be a permanent employee of the U.S. Environmental Protection Agency. Each member must be either an engineer or technical professional having at least 3 years experience working in hazardous waste remediation. The forum allows for a maximum of three members one from RCRA, one from CERCLA and one alternate position from either RCRA or CERCLA.~~

B. MEMBERSHIP RESPONSIBILITIES

1) Each member is expected to actively participate in monthly conference calls and biannual TSP meetings. ~~A member may be dropped if there is no participation in four consecutive conference calls or half of the monthly conference calls in any 12 month period.~~ All membership issues will be referred to and resolved by the co-chairs with help from regional management, the Federal Facilities Leadership Council, and EPA Headquarters.

2) Each member must join and actively participate in a forum workgroup or activity (Participation is defined as being involved in at least one Engineering Forum work product in a year. A work product is an item such as issue paper, reviewing and commenting on guidance documents, providing training or technical assistance, etc.). Members are to report on the progress of the work group or product during the conference calls. In addition, members will be asked to report on their participation and accomplishments biannually, to support the Forum's report to Headquarters.

3) Members in consultation with their management are responsible for finding an alternate member or replacement who will carry out their responsibilities if they are unable to do so.

4) ~~Members will be required to disseminate information on national and technical issues within the individual regions and regionally incorporated States, as applicable.~~

5) ~~Members will develop stances on engineering-related technical issues.~~

6) Members will raise regional technical and policy issues to the Forum during the monthly conference calls. Members will seek to identify inter-regional technical ~~engineering~~ and policy

problems. Solutions, suggestions, and/or recommendations will be developed within the Forum and/or directed to the EPA laboratories, EPA Headquarters, and other appropriate organizations for further research and policy development. ~~Where appropriate, the problem will be raised to OSWER to develop policy or guidance.~~

7) ~~Members may act as intra- and inter-regional engineering resources.~~

C. CO-CHAIR RESPONSIBILITIES [NOTE: The following sections on co-chair responsibilities and elections were not discussed.]

1) All membership issues will be referred to and resolved by the co-chairs.

2) Co-chairs will preside over monthly conference calls and general meetings.

3) Co-chairs will develop the agendas for the conference calls and meetings mentioned above, after consulting with the Forum at large.

4) Co-chairs will monitor the monthly agenda activities and progress such as work group activities, issue papers, and other agenda items.

5) All official correspondence will be generated by the Co-chairs.

6) Co-chairs will act as the central point of contact for inter- and extra-Forum activities.

7) The Co-chairs will communicate, in writing, the official position statements of the Forum. Official position statements will be developed by the Co-chairs following the consensus of the Forum at large. Co-chairs may delegate the authority for issuing a specific position statement to the relevant work group chairs.

8) Under no circumstances may an individual Forum member issue a position statement, oral or written, which represents the Forum at large. It is the responsibility of the individual Forum members to ensure that their individual position statements not be construed as representing the Forum as a whole.

D. CONFERENCE CALL AND MEETING SCHEDULE

1) The general conference calls will be held on the second Thursday of every month, from 1:30 to 3:00 p.m. (EST), unless otherwise indicated.

2) Workgroups conference calls and meetings will be held on an as needed basis.

3) The TSP general business meetings will be held biannually with one meeting in the Fall and one in the Spring at a location to be agreed upon by the Engineering, Ground Water and Federal Facilities Forums.

E. CO-CHAIR ELECTION PROCESS

1) Co-chairs are elected for one three-year staggered terms.

2) Each region shall have two votes divided among all eligible members.

3) Nominations for the Co-chair position will be held prior to the May conference call. Only members in good standing are eligible for nomination.

4) Members will send their votes to the contractor providing support for the TSP, prior to the June conference call meeting. The contractor will tally the results and send them to the Engineering Forum Co-chairs.

5) Election results will be announced at the June Conference call and e-mailed to the Forum members.

6) A majority vote will determine the Co-chair.

7) If a Co-chair is no longer able to fulfill his/her duties prior to the end of their term, a special election for the remaining portion of that term will be held if the term remaining is greater than three months.

As a member of EPA's Engineering Forum, I agree to carry out the Forum's mission while meeting the requirements of the organization as outlined above. I fully understand that failure to meet the requirements set forth above may result in the termination of my membership.

Signature Date

APPENDIX B
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